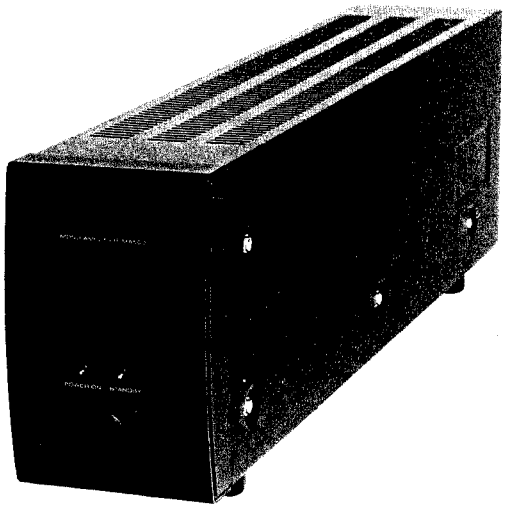
Service Manual

74 MA500/01B

Mono Amplifier



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marantz®

model MA500

First issue : 1993

4822 725 51016
PCS68 259

1. TECHNICAL SPECIFICATIONS

Rated Power Output ·····125 Watts into 8 Ω RMS
Total Harmonic Distortion ·····<0.05% at 8 Ω
Input Sensitivity/Input Impedance ·····1 V RMS/30 kΩ
Frequency Response ·····10 Hz to 100 kHz
(−1 dB at 1 Watts)
Signal to Noise Ratio (A − weighted) ·····>116 dB
Damping Factor (at 8 Ω) ·····200

Power Requirement ····· 115/120/230/240 V AC
50/60 Hz

Power Consumption
(1/8 rated power into 8 Ω) ·····110 Watts

Dimensions
Width ·····3 − 5/16 inches (84 mm)
Height ·····5 − 3/16 inches (132 mm)
Depth ·····17 − 3/4 inches (450 mm)
Weight ·····13.2 lbs (6.0 kg)
Accessories ·····Remote control cable×1

Design and specifications subject to change without notice.

2. TEST EQUIPMENT REQUIRED FOR SERVICING

This table the test equipment required for servicing.

Item	Use
Distortion Analyzer	Distortion measurements
Audio Oscillator	Sinewave and squarewave signal source
ACVTVM	Voltage measurements (AC)
Oscilloscope	Waveform analysis and trouble shooting and ASO alignment
Circuit Tester	Trouble shooting
DCVTVM	Voltage measurements (DC)
AC Wattmeter	Monitors primary power to amplifier
Line Voltmeter	Monitors potential of primary power to amplifier
Variable Autotransformer	Adjust level of primary power to amplifier
Shorting Plug	Shorts amplifier input toeliminate noise pickup

3. IDLING CURRENT ADJUSTMENT

1) With the power OFF, set semi − fixed resistor R708 on the PC board (P701) to the center position.
2) Connect a digital multimeter, set for the DC V range, between the test pins (J702) on the PC board (P701).
3) After the above, adjust the idling current as follows :
Turn the power ON and adjust semi − fixed resistor R708 while observing the digital multimeter indication.

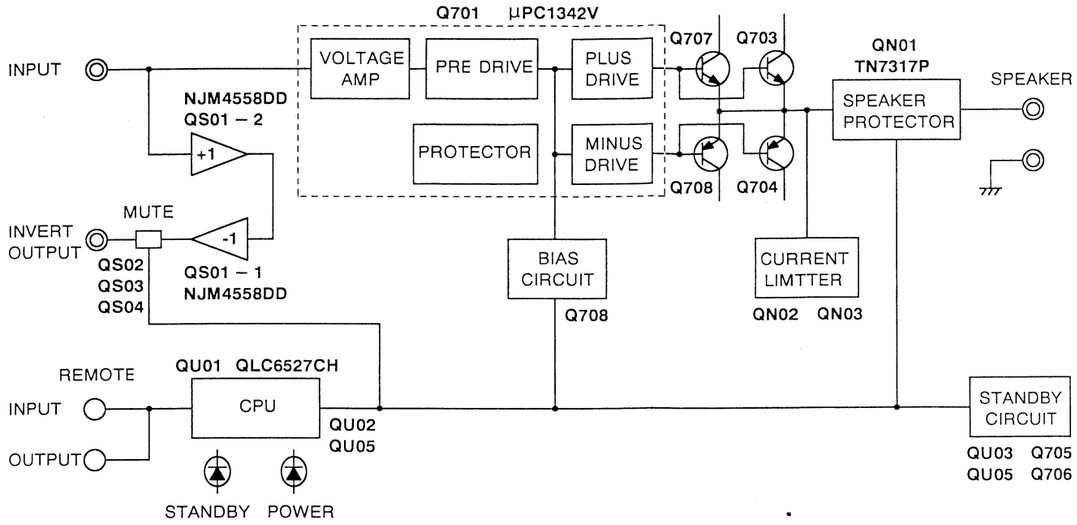
* The target value is 7 mV (19 mA).

[Reference]

When a set whose idling current has been adjusted is switched on with after 1 minute it reaches about 4.5 mV. After 10 minutes, it reaches a balanced state and stabilizes at 7 mV (target). Therefore, if the adjustment is made between 30 seconds and 1 minute after the power is switched on, adjust to 3.5 mV. In the same way, if 1 to 2 minutes have passed since the power was switched on, adjust to 4.5 mV. From 2 to 3 minutes, adjust to 6 mV. After more than 5 minutes since the power was switched on, adjust to the setting of 7 mV.
Here is a reference table for the adjustment values.

Time since power switched on	Idling current adjustment
30 seconds − 1 minute	3.5 mV
1 − 2 minutes	4.5 mV
2 − 3 minutes	6 mV
More than 5 minutes	7 mV

4. BLOCK DIAGRAM



● PIN ASSIGNMENT TABLE

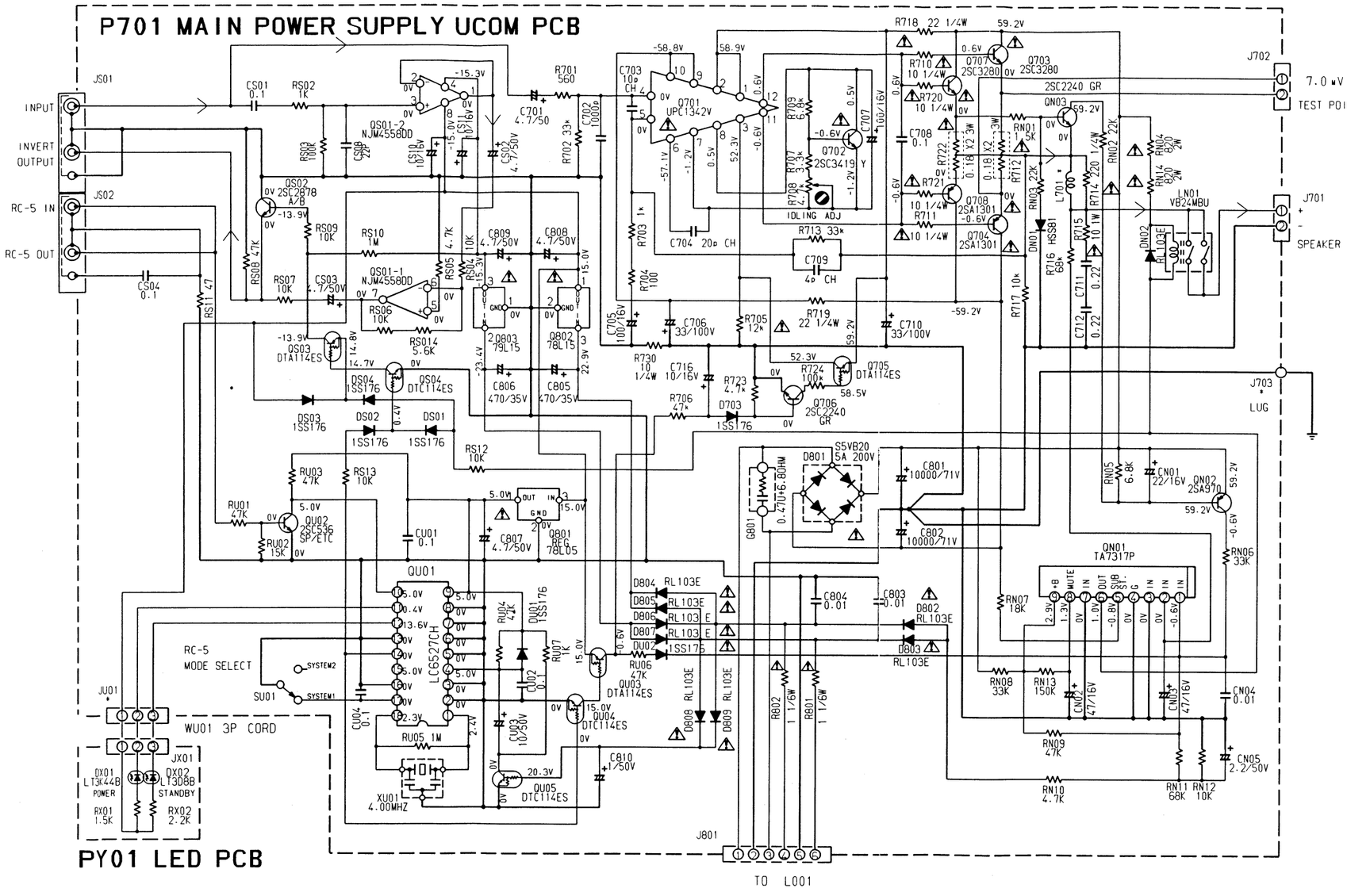
QU01
LC6527CH

PIN NO.	PORT NAME	I/O	ACT	FUNCTION
1	OSC1	I	−	4.00MHz
2	TEST	−	−	GND
3	VSS	−	−	GND
4	$\overline{RES}$	I	L	REST
5	PA0	−	−	GND
6	PA1	−	−	GND
7	PA2	−	−	GND
8	PA3	−	−	GND
9	VDD	−	−	+ 5V
10	PC0	I	L	RC − 5 INPUT
11	PC1	O	L	POWER ON LED
12	PC2	O	L	STAND BY LED
13	PC3	O	−	RC − 5 RECEIVE LED
14	PD0	O	H	STAND BY OUT
15	PD1	I	−	5V
16	PD2	I	−	GND
17	PD3	I	−	GND (＊SYSTEM1) ／+ 5V (＊＊SYSTEM2)
18	OSC2	I	−	4.00MHz

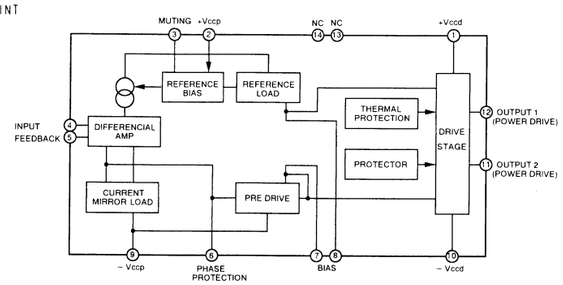
NOTE 1) ＊SYSTEM1 is for the Remote Controler with Power SW (ex. Moedl AV500, etc.).
2) ＊＊SYSTEM2 is for the Remote Controler that turns on the Power SW by Function SW (ex. Model SR-92, etc.).

◆ BUS SYSTEM (SYSTEM1／SYSTEM2) SW is on the Rea panel.

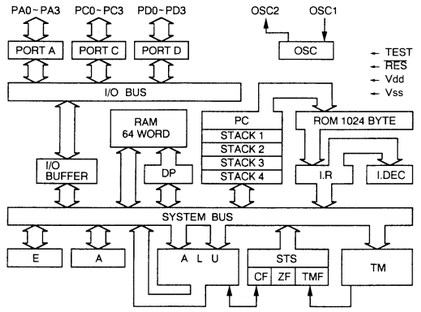
5. SCHEMATIC DIAGRAM



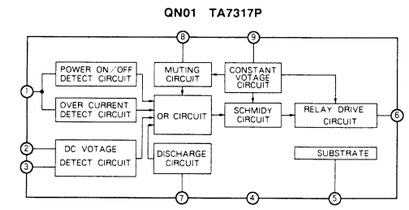
Q701 μPC1342V



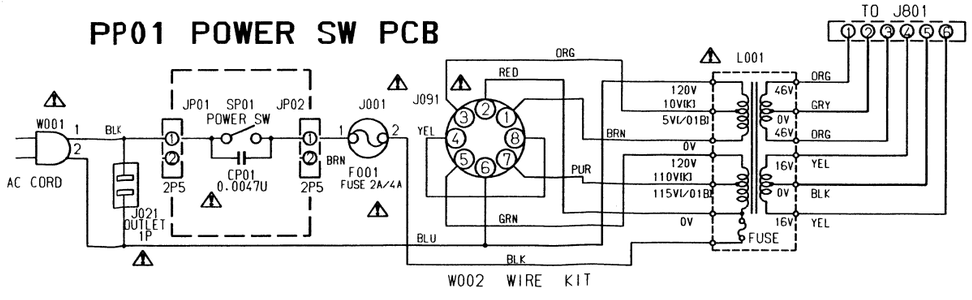
QU01 LC6527CH



QN01 TA7317P

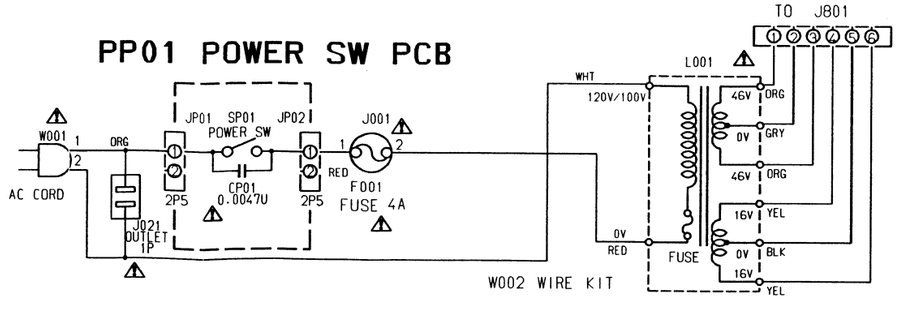


PP01 POWER SW PCB



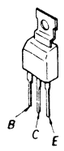
FOR K/01B

PP01 POWER SW PCB



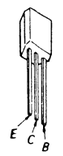
FOR U/F

6. CIRCUIT BOARD DIAGRAM (PATTERN SIDE)



2SA970
QN02

2SC2240 (GR)
QN03,Q706
2SC2878 (A,B)
QS02

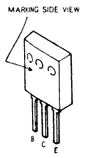


DTA114ES
QS03, Q705,
QU03

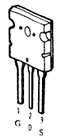
DTC114ES
QS04,QU04,
QU05

2SC536SP,ETC
QU02

2SC3419 Y
Q702

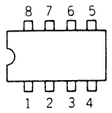


2SC3280(R,O)
Q703,Q707



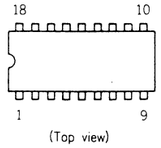
2SA1301(R,O)
Q704,Q708

TA7317P
QN01



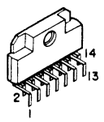
NJM4558DD
QS01

(Top view)

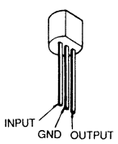


LC6527H-4B27
QU01

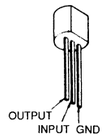
(Top view)



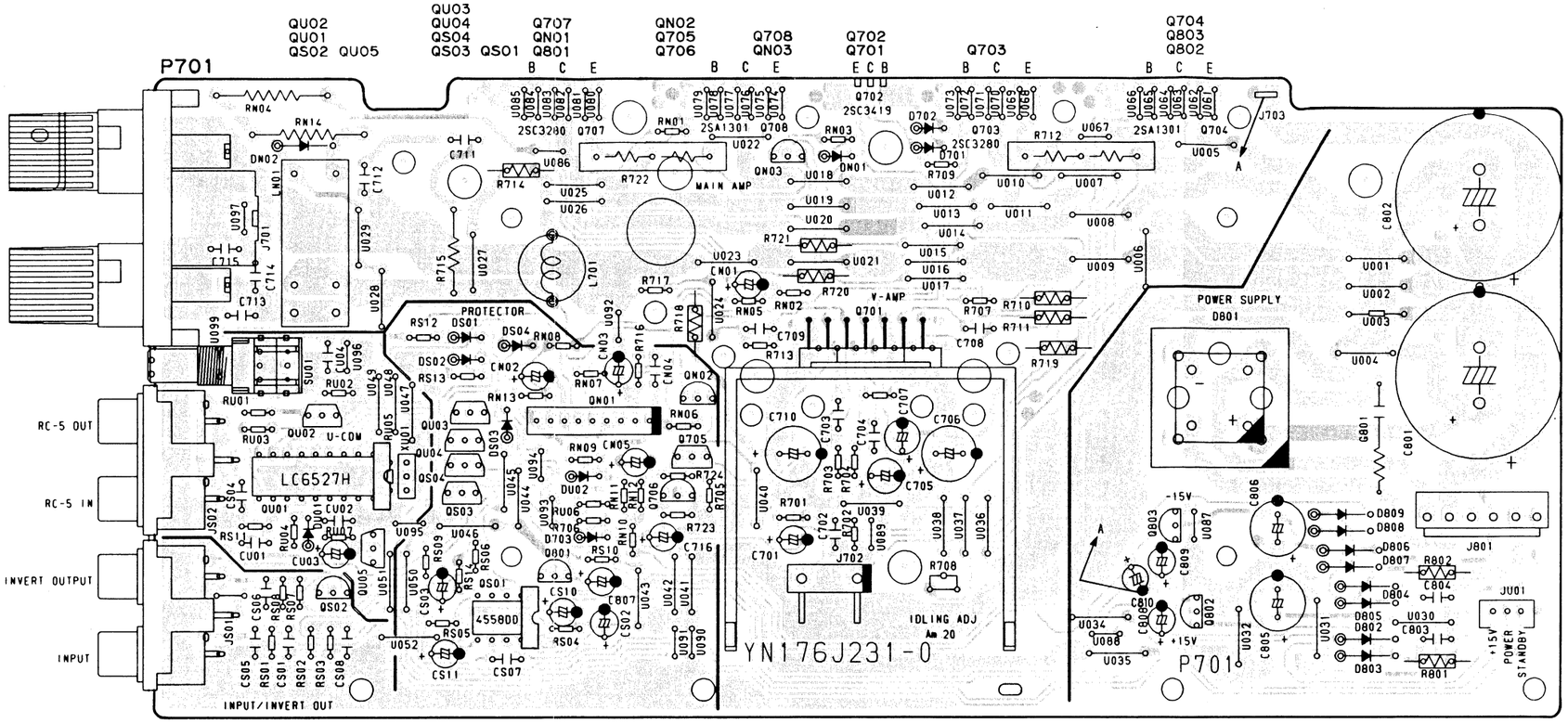
UPC1342V
Q701



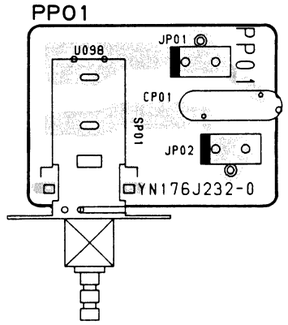
NJM78L05A
Q801
NJM78L15A
Q802



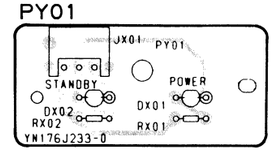
NJM79L15A
Q803



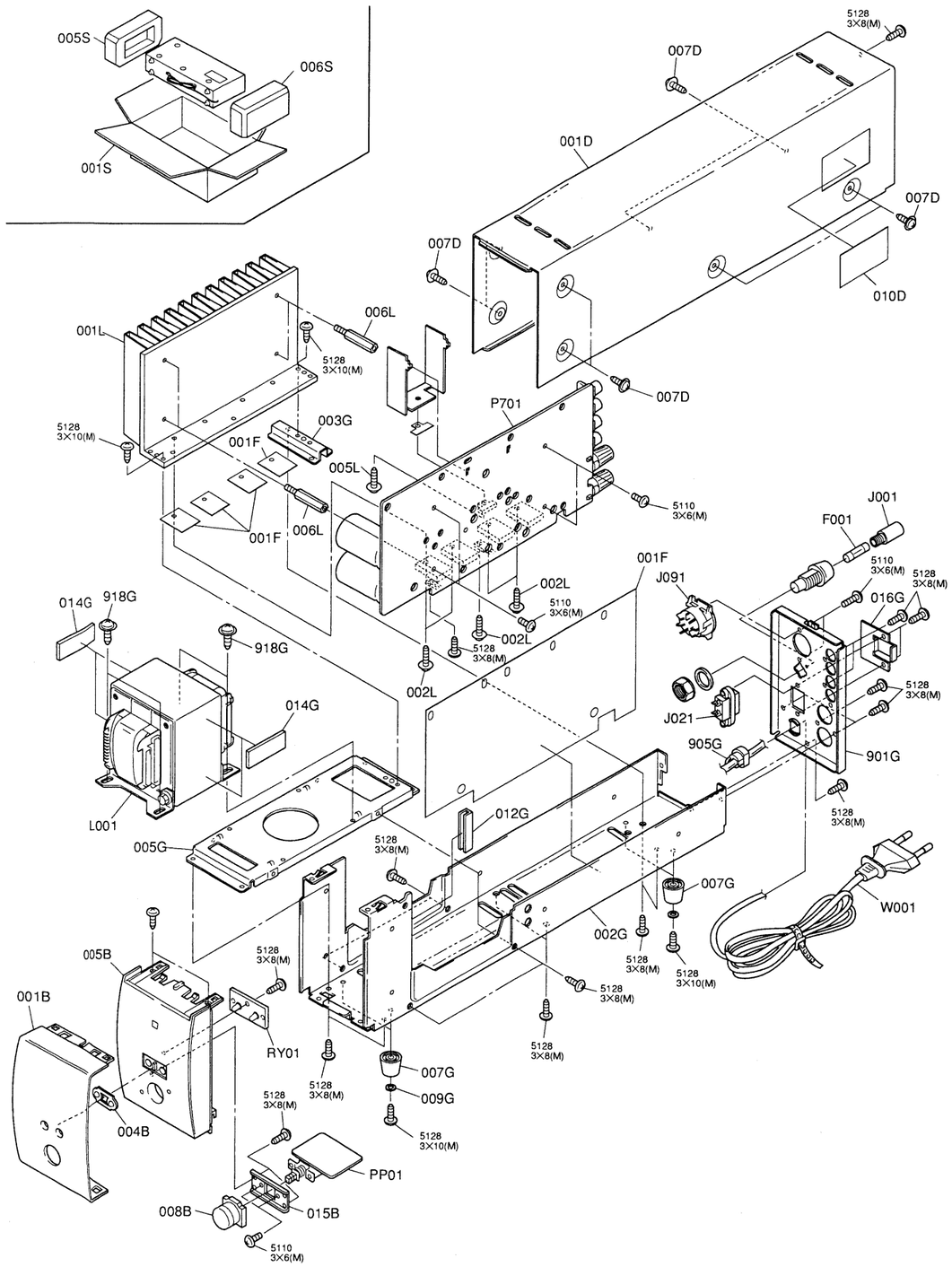
PP01



PY01



7. EXPLODED VIEW AND PARTS LIST



REF. DESIG.	PART NO.	DESCRIPTION
001B	4822 426 51638	FRONT PANEL AL PANEL
004B	4822 381 11415	LENS FOR POWER/STADBY
005B	4822 464 90768	FRONT MLD CHASSIS
008B	4822 410 62604	POWER BUTTON ASSY
001F	4822 466 92249	INSULATOR DENKA SHEET
007G	4822 462 42026	LEG
012G	4822 532 21473	BUSHING FOR SHARP EDGE
905G	4822 532 60948	BUSHING AC CORD BUSH
001T	4822 736 21727	USER MANUAL
⚠ Z001	4822 253 30387	FUSE 4 A 250V UL/CSA
Z003	4822 321 62012	CONNECTIVE CORD RCA PIN CORD
⚠ F001	4822 070 32001	FUSE 2 A 250V BS LISTED
⚠ J001	4822 256 30233	JACK FUSE HOLDER
⚠ J021	4822 265 20637	JACK AC OUTLET 1P M7030
⚠ J091	4822 272 10327	VOLT. SELECT. 2POLE-4POSITION
⚠ L001	4822 146 21729	POWER TRANSFORMER

NOTE ON SAFETY:
Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replaced any part marked with symbol ⚠. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

8. ELECTRICAL PARTS LIST

ASSIGNMENT OF COMMON PARTS CODES.

RESISTOR

R＊＊＊ : (1) GD05 xxx 140, Carbon film fixed resistor, ± 5 % 1／4W
R＊＊＊ : (2) GD05 xxx 160, Carbon film fixed resistor, ± 5 % 1／6W

① — Resistance value

Examples ;
① Resistance value

0.1 Ω...001	10 Ω...100	1k Ω...102	100k Ω...104
0.5 Ω...005	18 Ω...180	2.7k Ω...272	680k Ω...684
1 Ω...010	100 Ω...101	10k Ω...103	1M Ω...105
6.8 Ω...068	390 Ω..391	22k Ω...223	4.7M Ω...475

(Note) Please distinguish 1／4W from 1／6W by the shape of parts used actually.

C＊＊＊ : CERAMIC CAP.
(1) DD1x xxx 370, Ceramic condenser
Disc type
Temp.coeff.P350～N1000,50V
① ② — Capacity value, Tolerance

Examples
①Tolerance (Capacity deviation)
± 0.25pF ... 0
± 0.5pF ... 1
± 5 % ... 5
＊ Tolerance of COMMON PARTS handled here are as follows :
0.5pF～ 5pF...± 0.25pF
6pF～ 10pF...± 0.5pF
12pF～ 560pF...± 5 %
②Capacity value

0.5pF...005	3pF...030	100pF...101
1pF...010	10pF...100	220pF...221
1.5pF...015	47pF...470	560pF...561

C＊＊＊ : CRAMIC CAP.
(1) DK16 xxx 300, High dielectric constant ceramic condenser
Disc type
Temp.chara. 2B4, 50V
① — Capacity value

Examples
②Capacity value

100pF...101	1000pF...102	10000pF...103
470pF...471	2200pF...222	

C＊＊＊ : ELECTROLY CAP.(⧻), FILM CAP.(⫟)
(1) EA xxx xxx 10, Electrolytic condenser
One-way lead type, Tolerance ± 20 %
① ② — Dielectric strength, Capacity value

Examples
①Capacity value

01. μ F...104	4.7 μ F...475	100 μ F...107
0.33 μ F...334	10 μ F...106	330 μ F...337
1 μ F...105	22 μ F...226	1100 μ F...108
		2200 μ F...228

②Working voltage

6.3V...006	25V...025
10V...010	35V...035
16V...016	50V...050

(2) DF15 xxx 350, Plastic film condenser
One-way type, Mylar ± 5 % 50V
① — Capacity value

Examples
①Capacity value

0.001 μ F (1000pF)...102	0.1 μ F...104
0.0018 μ F.....182	0.56 μ F...564
0.01 μ F.....103	1 μ F...105
0.015 μ F.....153	

REF. DESIG.	PART NO.	DESCRIPTION
		PP01-POWER SW CIRCUIT BOARD
CP01	4822 122 32017	CERAMIC 0.0047UF ±20% AC400V
SP01	4822 276 12924	PUSH SWITCH ESB-82106V
		PY01-LED CIRCUIT BOARD
DX01	4822 130 81715	L.E.D. LT3K44B GREEN
DX02	4822 130 80326	L.E.D. LT3D8B RED
		P701-MAIN POWER SUPPLY CIRCUIT BOARD
		P701-CAPACITORS
CN04	4822 122 32486	CERAMIC 0.01 μF +80% -20% 50V
CS01	4822 122 40617	CERAMIC 0.1 μF +80% -20% 50V
CS04	4822 122 40617	CERAMIC 0.1 μF +80% -20% 50V
CS08	5322 122 32143	CERAMIC 22pF ±5% 50V
CU01	4822 122 40617	CERAMIC 0.1 μF +80% -20% 50V
CU02	4822 122 40617	CERAMIC 0.1 μF +80% -20% 50V
CU04	4822 122 40617	CERAMIC 0.1 μF +80% -20% 50V
C703	4822 122 32185	CERAMIC 10pF ±0.5pF 50V
C704	4822 126 12696	CERAMIC 20pF ±5% 50V
C706	4822 124 23994	ELECT 33 μF 100V
C709	5322 122 34107	CERAMIC 4pF ±0.25pF 50V
C710	4822 124 23994	ELECT 33 μF 100V
▲ C801	4822 124 80534	ELECT 10000 μF 71V
▲ C802	4822 124 80534	ELECT 10000 μF 71V
C803	4822 122 32486	CERAMIC 0.01 μF +80% -20% 50V
C804	4822 122 32486	CERAMIC 0.01 μF +80% -20% 50V
C805	4822 124 80533	ELECT 470 μF 35V
C806	4822 124 80533	ELECT 470 μF 35V
		P701-RESISTORS
▲ RN04	4822 053 11821	820Ω 2W
▲ RN14	4822 053 11821	820Ω 2W
R708	4822 100 11235	TRIMMING 4.7KΩ
▲ R710	4822 052 10109	10Ω ± 5% 1/4W
▲ R711	4822 052 10109	10Ω ± 5% 1/4W
▲ R712	4822 111 91225	0.18Ω 3W X 2
R714	4822 116 83929	220Ω ± 5% 1/4W
▲ R715	4822 053 10109	10Ω 1W

REF. DESIG.	PART NO.	DESCRIPTION
		P701-RESISTORS
▲ R718	4822 115 90119	22Ω ± 2% 1/4W (FUSIBLE)
▲ R719	4822 115 90119	22Ω ± 2% 1/4W (FUSIBLE)
▲ R720	4822 052 10109	10Ω ± 5% 1/4W
▲ R721	4822 052 10109	10Ω ± 5% 1/4W
▲ R722	4822 111 91225	0.18Ω 3W X2
▲ R801	4822 116 82805	1Ω ± 5% 1/6W
▲ R802	4822 116 82805	1Ω ± 5% 1/6W
U003	4822 052 10109	10Ω ± 5% 1/4W
		P701-SEMICONDUCTORS
▲ DN01	4822 130 80837	DIODE HSS81
DN02	4822 130 32508	DIODE RL103E(RECTRON)/DSF10C
DS01 ~ DS04	4822 130 33305	DIODE 1SS176, MA165, 1SS254
DU01	4822 130 33305	DIODE 1SS176, MA165, 1SS254
DU02	4822 130 33305	DIODE 1SS176, MA165, 1SS254
D703	4822 130 33305	DIODE 1SS176, MA165, 1SS254
▲ D801	4822 130 30984	DIODE S5VB20
D802 ~ D809	4822130 32508	DIODE RL103E(RECTRON)/DSF10C
QN01	4822 209 83312	IC TA7317P
QN02	4822 130 42949	TRANSISTOR 2SA970
▲ QN03	4822 130 43231	TRANSISTOR 2SC2240 GR
QS01	4822 209 83631	IC NJM4558DD
QS02	4822 130 43819	TRANSISTOR 2SC2878 (A, B)
QS03	4822 130 61227	TRANSISTOR DIGITAL DTA114ES
QS04	4822 130 60588	TRANSISTOR DIGITAL DTC114ES
QU01	4822 209 32371	MICROPROCESSOR LC6527H-4B27
QU02	4822 130 42298	TRANSISTOR 2SC536SP, ETC
QU03	4822 130 61227	TRANSISTOR DIGITAL DTA114ES
QU04	4822 130 60588	TRANSISTOR DIGITAL DTC114ES
QU05	4822 130 60588	TRANSISTOR DIGITAL DTC114ES

REF. DESIG.	PART NO.	DESCRIPTION
▲ Q701	4822 209 31613	IC UPC1342V
▲ Q702	4822 130 60117	TRANSISTOR 2SC3419 Y
▲ Q703	4822 130 60116	TRANSISTOR 2SC3280(R, O)
▲ Q704	4822 130 60109	TRANSISTOR 2SA1301(R, O)
Q705	4822 130 61227	TRANSISTOR DIGITAL DTA114ES
Q706	4822 130 43231	TRANSISTOR 2SC2240 (GR)
▲ Q707	4822 130 60116	TRANSISTOR 2SC3280(R, O)
▲ Q708	4822 130 60109	TRANSISTOR 2SA1301(R, O)
▲ Q801	4822 209 71373	IC NJM78L05A
▲ Q802	4822 209 71038	IC NJM78L15A
▲ Q803	4822 209 71039	IC NJM79L15A
		P701-MISCELLAEOUS
G801	4822 121 20263	CAP. COMP. SPARK KILLER RFD2B474K
JS01	4822 265 20355	TERMINAL 2P RCA PIN JACK
JS02	4822 290 81597	TERMINAL 2P RCA PIN JACK
J701	4822 290 81596	TERMINAL SPK. BROWN/RED
LN01	4822 280 70354	RELAY VB24MBU
L701	4822 157 70022	AIR COIL SPK CHOCK COIL
SU01	4822 275 10268	ROTARY SWITCH SRBM12N-S15
XU01	4822 242 72223	CERAMIC VIB. CERALOCK CST4.00M GW